

Claims

1. A Biodegradable composition comprising:
between 40 and 85 % by weight of poly(lactic acid),
5 between 10 and 40 % by weight of poly(epsilon caprolactone), and
5 and 10 % by weight magnesium silicate,
each on the basis of the total weight of the Biodegradable composition.
2. The Biodegradable polymer composition according to claim 1, said composition
10 comprising at least two of the elements selected from the group consisting of
magnesium, and silicon.
3. The Biodegradable polymer composition according to claim 1, to which composition
during its preparation less than 5 % of an organic peroxide, on the basis of the total
15 weight of the final Biodegradable composition, has been added.
4. The Biodegradable polymer composition according to claim 3, to which composition
during its preparation less than 2 % of an organic peroxide, on the basis of the total
weight of the final Biodegradable composition, has been added.
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5. The Biodegradable composition according to claim 4, to which composition during its
preparation less between 0.1 to 1.8 % of an organic peroxide, on the basis of the total
weight of the final Biodegradable composition, has been added.
- 25 6. The Biodegradable polymer composition according to claim 3, wherein said organic
peroxide is selected from the group consisting of diacetyl peroxide, cumyl-hydro-
peroxide, dibenzoyl peroxide, 2,5-dimethyl-2,5-di-(terbutylperoxy)hexane, or a mixture
thereof.
- 30 7. The Biodegradable polymer composition according to claim 1, said composition
further comprising of co-polyester polymer with adipic acid in an amount of less than

5 % by weight on the basis of the total weight of the composition.

8. The Biodegradable polymer composition according to claim 7, to which composition during its preparation less than 5 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.
9. The Biodegradable polymer composition according to claim 7, to which composition during its preparation less than 2 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.
10. The Biodegradable composition according to claim 7, to which composition during its preparation less between 0.1 to 1.8 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.
11. A film or coating, comprising a Biodegradable composition, said Biodegradable composition comprising:
between 40 and 85 % by weight of poly(lactic acid),
between 10 and 40 % by weight of poly(epsilon caprolactone), and
5 and 10 % by weight of magnesium silicate,
each on the basis of the total weight of the Biodegradable composition.
12. The film or coating according to claim 11, said film or coating being selected from the group consisting of coatings or films on an article comprising a material selected from the group consisting of paper, plastics, wood or composite materials comprising at least one of the above-mentioned materials, bag films, container sealing films.
13. The film or coating according to claim 11, to which composition during the preparation less than 5 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.
14. The film or coating according to claim 11, to which composition during its

preparation less than 2 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.

- 5 15. The film or coating according to claim 11, to which composition during its preparation less between 0.1 to 1.8 % of an organic peroxide, on the basis of the total weight of the final Biodegradable composition, has been added.
- 10 16. The film or coating according to claim 15, wherein said organic peroxide is selected from the group consisting of diacetyl peroxide, cumyl hydro peroxide, and dibenzoyl peroxide.
- 15 17. The film or coating according to claim 11, said composition further comprising of copolyester polymer with adipic acid in an amount of less than 5 % by weight on the basis of the total weight of the composition.
18. The film or coating according to claim 11, said composition further comprising at least two of the elements selected from the group consisting of magnesium, aluminium, and silicon.
- 20 19. The film or coating according to claim 11, said composition further comprising plasticizers.
- 25 20. The film or coating according to claim 13, said composition further comprising up to 5 % of a mono-ester, on the basis of the total weight of the Biodegradable composition.
- 30 21. A molded or formed article comprising a Biodegradable composition, which Biodegradable composition comprises between 40 and 85 % by weight of poly(lactic acid) , between 10 and 40 % by weight of poly(epsilon caprolactone), and between 5 and 10 % by weight of magnesium silicate, each on the basis of the total weight of the Biodegradable composition.

22. A molded or formed article according to claim 21, said molded or formed article being selected from the group consisting of utensils, table service-ware forks, spoons, knives, chopsticks, containers, cups, foam material products, and pots.
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23. An article comprising a section made of a material selected from the group consisting of paper, plastics, wood or composite materials comprising at least one of the above-mentioned materials, said section being coated with a coating or a film, said coating or film comprising between 40 and 85 % by weight of poly(lactic acid), between 10 and 10 40 % by weight of poly(epsilon caprolactone), and between 5 and 10 % by weight of magnesium silicate each on the basis of the total weight of the Biodegradable composition.
24. An article of claim 25, said article being food service-ware, plates, cups, packaging, 15 cardboard boxes, trays.
25. A method of producing an article comprising a Biodegradable composition, comprising the steps of:
providing a Biodegradable composition, said composition comprising
20 between 40 and 85 % by weight of poly(lactic acid),
between 10 and 40 % by weight of poly(epsilon caprolactone), and
between 5 and 10 % by weight of mineral particles, comprising magnesium silicate, each on the basis of the total weight of the Biodegradable composition; and
preparing a film or coating from said composition and optionally applying said film or
25 coating on an article comprising a material selected from the group consisting of paper, plastics, wood or composite materials comprising at least one of the above-mentioned materials.
26. A method of producing a Biodegradable composition, comprising the steps of:
30 (i) providing a composition comprising between 40 and 85 % by weight of poly(lactic acid), and between 10 and 40 % by weight of poly(epsilon caprolactone),

and between 5 and 10 % by weight of mineral particles, comprising magnesium silicate, each on the basis of the total weight of the Biodegradable composition, which method comprises the following steps:

- (ii) mixing the constituents of (i);
- 5 (iii) heating the mixture to a temperature 160 °C to 210 °C; and
- (iv) forming the resultant mixture to obtain a desired shape.

Summary

5 The present invention relates to biodegradable polymer compositions comprising poly(lactic acid) and poly(epsilon caprolactone) mixed with organic peroxide and magnesium silicate minerals. In addition, the present invention relates to films, coatings and products made on the basis of said compositions and to a method for their preparation.